

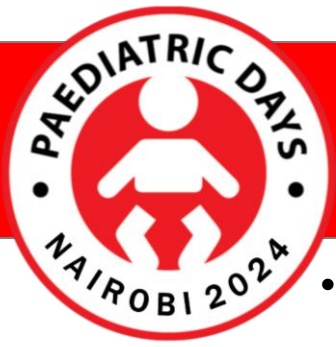


Towards an understanding of resurgent measles outbreaks in Kismayo, Somalia: a mixed-method investigation of measles burden and vaccination coverage during a 2020-2021 measles outbreak.

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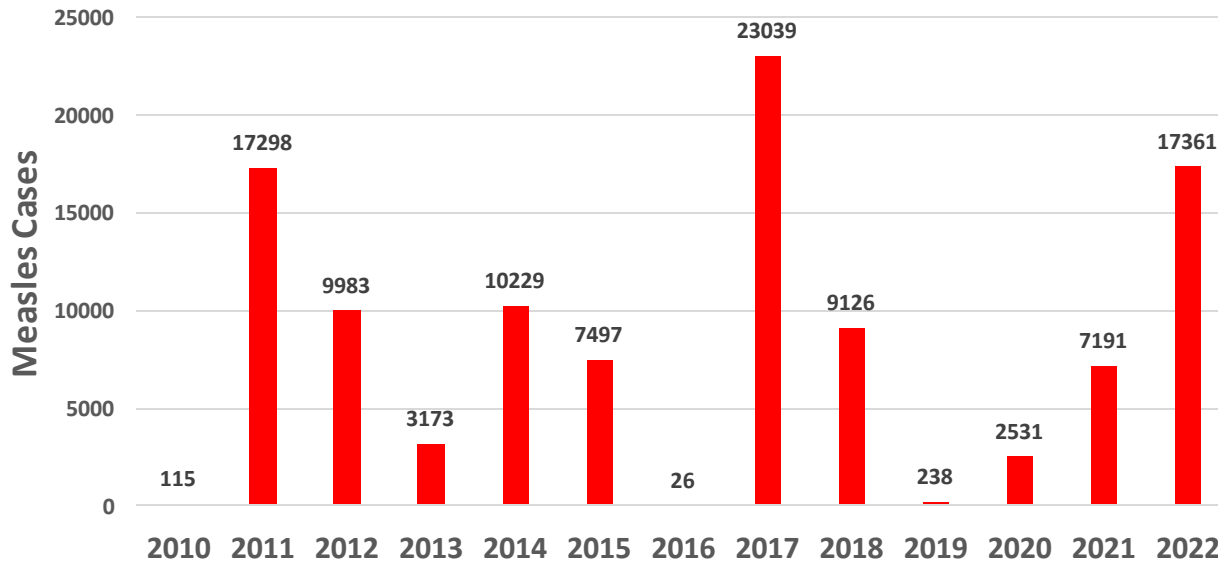




Introduction

- **Kismayo** – a port city in close to the Kenyan border; capital of Jubaland State; frequent population movements in/out due to evolving security situation and food security concerns. Problem of **resurgent measles outbreaks** in Kismayo and other parts of Somalia, despite availability of EPI services and reactive vaccination campaigns.
- Operational research as a partnership between **MSF OCG Jubaland Project** (now closed) and the **Jubaland State MoH**: to estimate measles burden and measles vaccination coverage during a 2020-2021 outbreak, while further identifying key barriers and facilitators for measles vaccination and care.

Measles Cases Reported to the WHO (2010-2022),
Somalia



Kismayo Health System

- **Measles care** available at Maternal and Child Health (MCH) clinics throughout Kismayo, or at the Kismayo General Hospital. Private facilities also available.
- **Two dose series of Measles Containing Vaccine (MCV)** are available without cost:
 1. At MoH health facilities one or two days per week (EPI)
 2. Through door-to-door vaccination (reactive campaigns)
- **Reactive vaccination campaigns** have been happening in Kismayo, but documentation remains a challenge. The authors were unable to find concrete dates and achievements of past campaigns.



Methods: a mixed-method investigation

Quantitative Methods

- Household survey with electronic questionnaire on Kobo Collect.
- Sample size calculation: 1,093 household (HH) target.
- Sampling method: simple random sample of rooftops captured in a satellite image of Kismayo.
- Recall period: 2 years (1 Feb 2020 to 31 Jan 2022).
- Enumerators: 12 two-person teams; 3 days of training with a pilot study, all conducted in Somali.
- Data collection: 5 days (2 – 6 Feb 2022).

Qualitative Methods

- Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs), with purposively sampled respondents.
- Sessions repeated until “saturation” of key themes.
- FGDs happened in person in Kismayo, facilitated by a study author, in Somali.
- KIIs happened at a distance, facilitated by a study author, in English.
- Thematic analysis of English-language transcripts conducted independently by two authors before consolidation of findings.

Quantitative results informed qualitative investigations



Results: sample population

Quantitative

- **1,050 households** provided informed consent to be surveyed (95.2% acceptance rate).
 - 6,664 individuals.
 - 50% female.
 - Average household size: 6.04.
 - Under 5 proportion: 19.1%.
 - IDPs: 27.4%.

Qualitative

- **13 Key Informant Interviews (KIIs)** completed.
 - 3 female respondents, 10 male respondents.
 - Professional affiliations:
 - UN Agency / NGO – 4.
 - MoH health workers – 6.
 - MoH administration – 3.
- **8 Focus Group Discussions (FGDs)** completed.
 - 24 female respondents, 40 male respondents.

Group Type (8 participants each; no mixed gender discussions)	
FGD 1	Religious Leaders (Male; Non-IDP)
FGD 2	Community Leaders (Male; IDP + Non-IDP)
FGD 3	Community Members (Female; IDP)
FGD 4	Community Members (Female; Non-IDP)
FGD 5	Traditional Healers (Male; IDP + Non-IDP)
FGD 6	Trad. Birth Attendants and Trad. Healers (Female; IDP + Non-IDP)
FGD 7	Community Members (Male; Non-IDP)
FGD 8	Community Members (Male; IDP)



Results: measles burden and MCV coverage

Estimated Measles Burden during 2-year Recall Period

Attack Rate (symptom-verified measles cases / sample population)	
<i>All ages</i>	5.1% (95%CI:4.6-5.6)
<i>Under 5 years</i>	12.0% (95%CI:10.2-13.8)
Case Fatality Ratio (deaths within 28 days of measles onset / symptom-verified measles cases)	
<i>All ages</i>	3.3% (95%CI:1.4-5.2)
<i>Under 5 years</i>	5.9% (95%CI:2.1-9.6)

Projected Number of Measles Cases and Deaths During 2-year Recall Period

Measles Cases (all ages)	20,662 (95%CI:18,637-22,688)
Measles Deaths (all ages)	567 (95%CI:284-1,134)

MCV Coverage Achieved Over 2-year Recall

Age	Doses	Recall start (n)	95%CI	Recall end (n)	95%CI	Change over 2-year recall period (n)
6m to 59m	1	46% (474)	43% – 49%	61% (706)	58% – 64%	15% (232)
	2	3% (35)	2% – 5%	8% (95)	7% – 10%	5% (60)
	>=1	50% (509)	46% – 53%	69% (801)	67% – 72%	19% (292)





Results: measles knowledge and care practices

Knowledge of one or more measles symptoms among surveyed households:

- Non-IDP HHs: 89.5%
- IDP HHs: 86.0%

“As leaders of the community, it is our responsibility to address the challenges faced by the people and raise awareness about any diseases that exist. Therefore, it is imperative that we encourage them to get vaccinated.”
-FGD Respondent (Community Leaders)

“I was not previously aware of measles, but I have learned about it through personal experience. One of my sons died and lost his sight due to a lack of knowledge about the disease ... I did not take him to the hospital when he became sick because I did not recognize the symptoms”

-FGD Respondent (Community Members, Non-IDP)

“In the Somali community, the words of religious leaders carry significant weight as they can cite Islamic teachings to support their messages. It is important for these leaders to educate the people about the benefits of the vaccine, because scientific arguments alone may not be persuasive enough”

-FGD Respondent (Religious Leaders)



Results: health seeking behaviour

Sought medical care for measles (excluding traditional healers):

- Non-IDPs: 37.2%
- IDPs: 52%

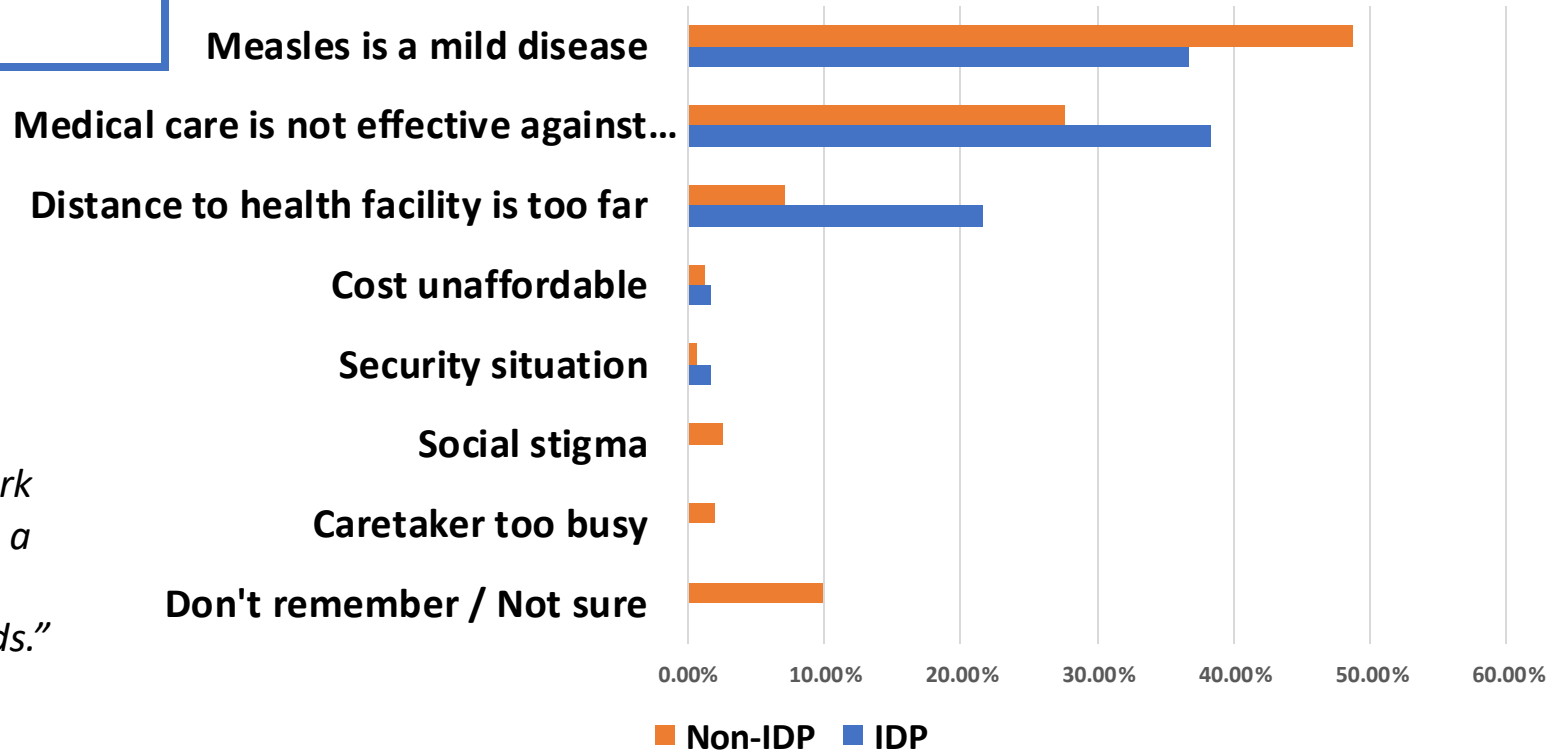
“Unfortunately, patients often lack health awareness, which results in delayed hospital visits and, in some cases, death.”

-KII Respondent (MoH Health Worker)

“The number of community mobilizers or CHWs who work in the community is very few compared to the need ... In a facility, there may be two to three CHWs compared to a location where there are maybe thousands of households.”

-KII Respondent (UN/NGO)

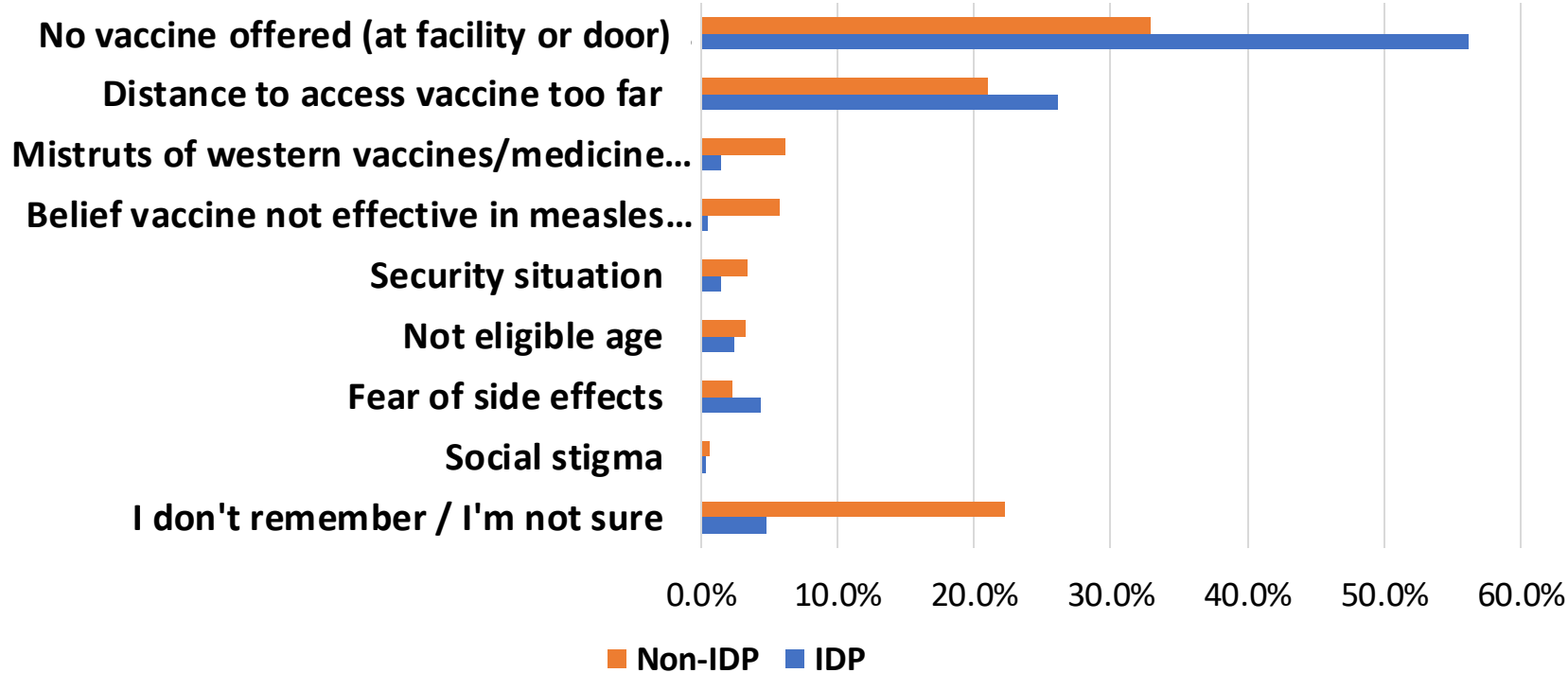
Reasons for Not Seeking Care (n=212)





Results: Reasons for non-vaccination (EPI)

Reasons for Non-Vaccination, (6m-15y; n=1426)



“People come to Kismayo for health services, which has become the central location of Jubaland [State]. One of the key factors [leading to prolonged measles outbreaks] is the number of unimmunized children in other areas, particularly areas controlled by al-Shabaab.”
-KII Respondent (UN/NGO)

“I recently took my son to a nearby hospital, where I was given a number and there were around 24 people ahead of me in line ... This long wait can be difficult for mothers who have to cook and do laundry for their families.”
-FGD Respondent (Community Leaders)

“Before immunisation, it's also good to do social mobilisation, create awareness, and involve the community leaders in the debate. So, the community leaders can also disseminate the message to the rest of the community.”
-KII Respondent (UN/NGO)





Results: Reasons for non-vaccination (campaign)

"I would say that the mistake originates from the NGOs responsible for administering the vaccinations. They tend to delegate the entire process to the workers, without proper oversight and control."

-FGD Respondent (Community Member, Woman, Non-IDP)

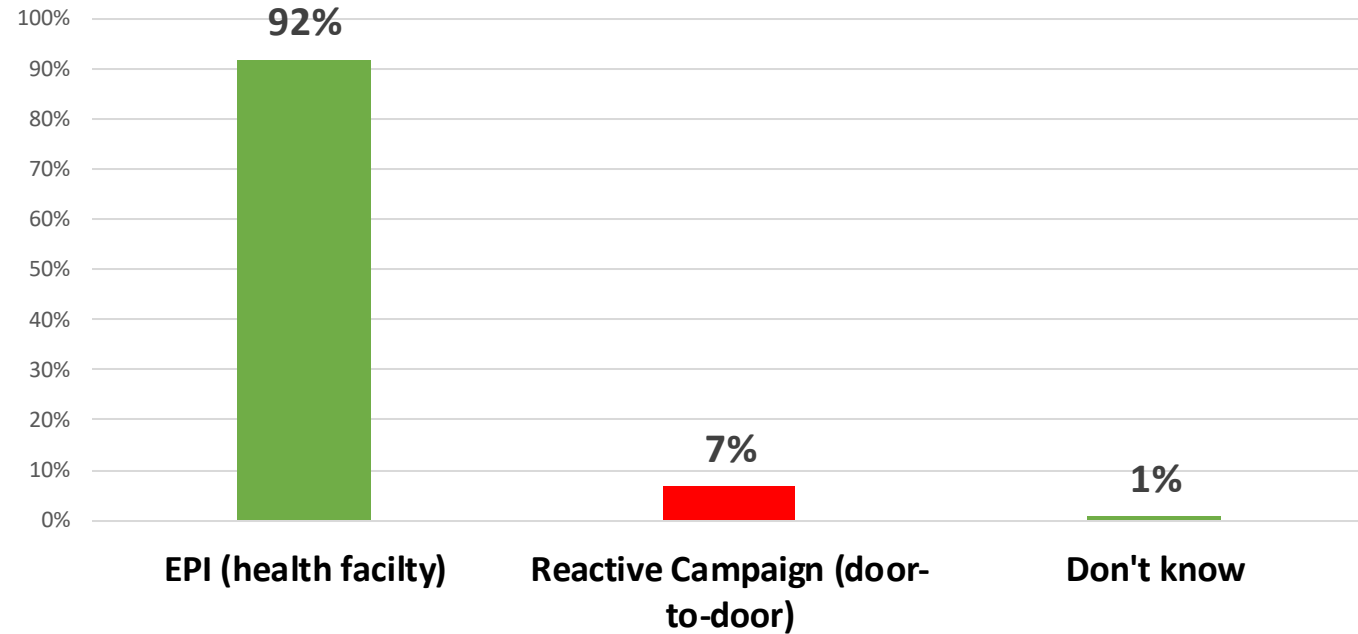
[Vaccinators] are called only one day prior to the campaign ... it's unclear if they are properly trained.

-KII Respondent (UN/NGO)

"Elders have pointed out that health workers who visit people [during campaigns] are often young, well-dressed individuals who may not understand the financial situation of those they are visiting ... It is important to have a respected figure who can understand and relate to the family's situation to effectively communicate the message of vaccination."

-FGD Respondent (Religious Leaders)

Source of Measles Vaccination





Discussion: barriers and facilitators

Barriers

1. Steady inflow of unvaccinated IDPs
2. Tendency to delay or forego measles care
3. Limited access to EPI vaccination.
4. Limited coverage achieved by reactive vaccination campaigns.
5. Sizable unvaccinated population above target cutoff age of 5 years.

Facilitators:

1. Good basic understanding of measles among the population.
2. Relatively low prevalence of vaccine hesitancy.
3. Supportive community and religious leaders.



Conclusion and recommendations

Kismayo has a high burden of measles, both in terms of morbidity and mortality. Vaccination coverage remains below the threshold needed for herd immunity and too many households forego medical care when sickness occurs. Despite this, we believe that the measles burden in Kismayo can be meaningfully reduced with the implementation of well-guided public health actions.

Recommendations

1. Prioritize risk communication and community engagement.
2. Increase access to care.
3. Ensure EPI vaccinations for measles are available at every point of contact with households.
4. Conduct more widespread reactive vaccination campaigns and consider implementing supplemental immunisation activities (SIAs).
5. Increase coverage of MCV2 at every opportunity.



Acknowledgements

We thank all individuals and organizations who made this research possible, including all study respondents, community leaders, research staff, and the Jubaland State Ministry of Health.

Ethical Statement

- All study activities conducted in accordance with the International Ethical Guidelines for Biomedical Research Involving Human Subjects and the International Ethical Guidelines for Epidemiological Studies.
- MSF Ethical Review Board Approval: #2175
- Jubaland State Ministry of Health Approval (in lieu of a national ethics review board): MoH/JSS/DG/060/2021